Portions of transparent tornado funnels have been reported frequently and have been observed by the writer in another storm. Storms are frequently observed in Fort Smith that approach tornadoes and may have invisible vortices. Clouds show boiling effects, parallel opposing cur-

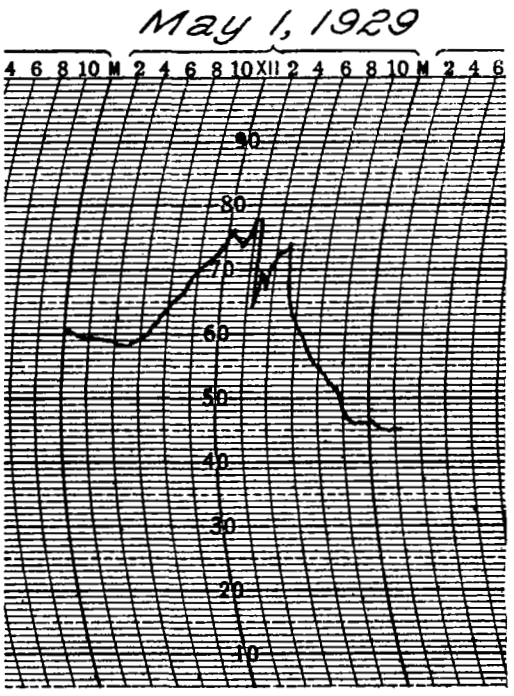

FIGURE 1.—Thermograph trace, Fort Smith, Ark., May 1, 1929

rents and vortices. The details of clouds in these storms are quite distinct showing striated effects, clouds moving in echelon, and mammato-cumulus forms are seen.

Tornado clouds are formed by the cooling of the air below the dew point by expansion incident to the decrease of pressure caused by rapid whirling.

It is interesting to note the chronological order of appearance of tornado cloud forms. The ascending currents without the outside cloud sheet, producing boiling effects and scud are the first to appear. The earlier funnels are usually thin, ropelike, and rather sharply defined like moisture condensing on the outside of a cold vessel. This condition lasts only a very short time as the cloud sheet rapidly thickens to a cone-shaped funnel. If this goes on further, rain falls and the funnel cloud is obscured or may disappear on account of diminishing intensity of the whirl.

The barograph during the storm of May 1 showed a pressure of 0.14 inch (fig. 2) during the two hours preceding, a fall of 0.09 inch during the storm, and a rise of 0.11 immediately after it. The lowest reading was 29.23 inches. Temperature showed a drop of 13° during the storm's passage. Unfortunately the wind partially failed to record and only a partial record was obtained. The maximum velocity as near as could be computed was 62 miles an hour and the extreme 74 miles. The velocity of the tornado was near the extreme velocity. The wind shifted 180° in one minute during the passage of the tornado. Practically all directions were represented by cloud and surface wind movements during the day. Opposing currents were observed in clouds during storm and an imposing display of cumulo-nimbus was observed immediately afterwards.

An interesting feature occurred in connection with the Fort Smith Handle Factory damage. The side walls of this building were blown outward as the funnel cloud passed, but the roof was not blown upward. The roof had a ventilating stack extending upward that relieved the upward pressure. Houses damaged in other parts showed roofs blown upward.

The damage in Fort Smith was light. Fortunately the storm was high in the air and it struck only one edge of the city with any degree of force. The damage in Fort Smith was estimated at $25,000. Five persons were hurt at Fort Smith and seven at Sand Prairie, Crawford County.

At 3:30 p. m. of the same day, Rex, a village 98 miles slightly north of east of Fort Smith was wiped out by a tornado. Two persons were seriously hurt and four received lighter injuries. The damage to this village was estimated at $40,000. Typical tornado clouds and conditions were reported. It was first thought this was the tornado that struck Fort Smith as it lies in the same direction of progress, but 98 miles an hour seems a rather high velocity for a tornado.

Severe hailstorm at Springfield, Ill., May 1, 1929. By C. J. Root).—A severe hail storm occurred in southern Illinois on the afternoon of May 1. It covered a strip varying from 2 to 6 miles in width and extended across Williamson and parts of Jackson and Saline Counties.

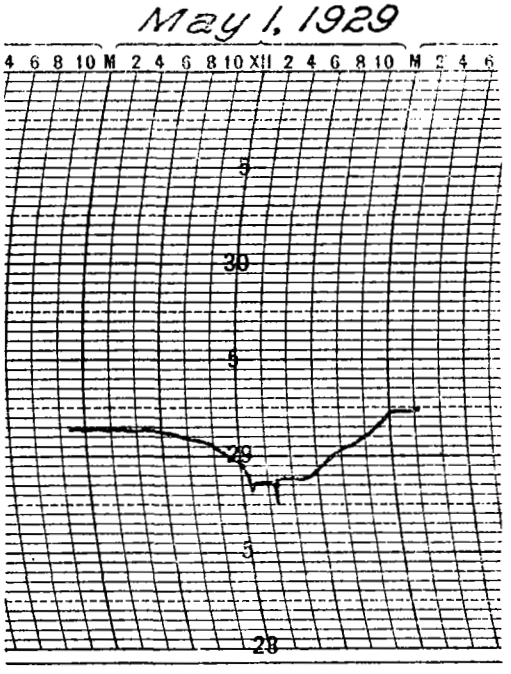

FIGURE 2.—Barograph trace, Fort Smith, Ark., May 1, 1929

Near the south edge of the path hail fell to a depth of several inches, the stones being about the size of marbles. At the Marion cemetery, at the north edge of Marion the writer saw the entire cemetery group of trees entirely denuded of foliage and having the appearance of midwinter. Shrubbery and small limbs were badly barked. Farther north the stones were larger but more scattered, causing less damage to vegetation but more to property. Stones were reported up to the size of hen eggs, and there were numerous instances of roofs and automobile tops being punctured. The losses will total several hundred thousand dollars.

Progressive desiccation in southwest Africa.—The late Prof. E. H. L. Schwarz, during his 10 year's work on the Geological Survey of Cape Colony, realized the extent to which some parts of the country had been impoverished

by drought. He devoted himself to the question of how this alarming process could be checked, and in 1918 published his well known scheme for the diversion of water from the Zambesi into the great depressions of Lake Ngami and the Kalahari.

In 1925, while on the Kalahari reconnaissance expedition, sent by the Government to investigate his proposals, Professor Schwarz found the country suffering from floods and he returned by canoe from the Victoria Falls to Lake Ngami, which was reoccupied by water, * * * Professor Schwarz has just published an account of his journeys in this region. In his book he says "A country that had resigned itself to a condition of permanent drought was for a time gladdened by the sound of rippling water on all sides." The book also contains a summary of the condition of Lake Ngami as follows: 1760, dry; 1813 to Livingston's visit in 1849, a great lake that had already begun to decline; 1854–1864, some shallow water surrounded by reeds; 1896–1922, no water, lake bed a dry plain; 1925 lake reoccupied by water.—*Reprinted from Nature, February 2, 1929.*

Snow cover in eastern Siberia.—W. B. Shostakovitch summarizes the snowfall in eastern Siberia as follows: Measurements have been made daily at 7 a. m. since 1881. Up to 1913 they had been made at 231 stations, only about 37 per cent of them, however, have so long a series as 5 years. The thickness of the snow cover, while it shows good correlation with precipitation, depends as well upon many other elements, such as air temperature, wind, evaporation, etc. February is the month of maximum snowfall. The depth in that month ranges from 10 to 100 centimeters (3.9 to 39 inches). Topographic features exert a great influence upon the accumulation of snow. On the windward slopes of mountains where the precipitation is heavy, the depth of snow increases considerably; on leeward slopes it decreases sharply. A snow sheet covers the ground from 25 to 70 days in the seaside district northeast of the Sea of Okhotsk and attains to 250 to 259 days in the extreme north regions. Almost all eastern Siberia lies under an uninterrupted snow cover during more than 150 days, the duration gradually increasing with latitude.

Meteorological summary for Chile, April, 1929. (*By J. Bustos Navarrete, Observatorio del Salto, Santiago, Chile.*)—Atmospheric circulation had moderate intensity during the month of April. In the central zone lack of precipitation continued, while in the southern zone there was normal intensity of rainfall.

The chief depressions, bringing foul weather and rain in the south, were those of the 1st–2d and 6th, crossing the extreme south, and, most important, that of the 20th causing general rains as far as Talca.

Periods of fine weather accompanied anticyclonic centers charted as follows: 7th–9th, in the southern region; 17th–18th, moving from Juan Fernandez to Chiloe; 25th–28th, advancing from southern Chile to the central part of northern Argentina.

The total monthly precipitation was 0.75 inch to 1.20 inches in the region of Concepcion and around 8 inches in region of Valdivia.—*Translated by W. W. R.*

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